

REMARKS

Applicant respectfully requests reconsideration of this application, as amended, and consideration of the following remarks. Claims 1, 14, 17 and 19 have been amended. Claims 1-23 remain pending. Claims 14, 15, 19, 20 and 22 stand rejected as being anticipated under 35 U.S.C. 102(e). Claims 1-11, 14-16 and 19-23 stand rejected as being anticipated under 35 U.S.C. 102(b). Claims 12, 13, 17 and 18 stand rejected as being unpatentable under 35 U.S.C. 103(a).

Amendments

Amendments to the Claims

Applicant has amended the claims to more particularly point out what Applicant regards as the invention. No new matter has been added as a result of these amendments.

Rejections

Rejections under 35 U.S.C. §102(e)

Claims 14, 15, 19, 20 and 22 stand rejected under 35 U.S.C. 102(e) as being anticipated by US Pat 6,702,651 by Tolles (hereafter the Tolles reference). Applicant respectfully traverses the rejection as will be described in more detail below.

The Tolles reference discloses a polishing material for chemical mechanical polishing has a mesh of fibers and a binder material holding the fibers in the mesh. The binder material coalesced among the fibers to leave pores in the interstices between the fibers of the mesh. The fibers and binder material provide the polishing material with a brittle texture. The fibers can be cellulose, and the binder material can be a phenolic resin. The Tolles reference further provides the:

“slurry/rinse arm 40 also includes several spray nozzles 44 to create high-pressure jets of a cleaning fluid, e.g., deionized water. The jets of cleaning fluid provide a high-pressure rinse of the polishing pad at the end of each polishing cycle in order to remove used slurry and polishing debris from the polishing pad. The slurry/rinse arm 40 ***can also include*** several air nozzles 46 that direct high-pressure jets of air into the polishing pad. These high-

pressure jets purge the cleaning fluid from of the polishing pad and prevent dilution of the slurry during the next polishing cycle. Alternatively, the spray nozzles 44 can be connected to both a cleaning fluid source and a pressurized air source in order to perform both the spray rinse and the air purge of the polishing pad, or to a vacuum source to suction cleaning fluid from the polishing pad.” (Col. 8, Ln 35-44, emphasis added).

As to claims 14 and 19, the Tolles reference does not disclose a system or method wherein the pressurized carrier gas and the rinsing solution are supplied simultaneously to the nozzle. It would not be obvious to modify the Tolles reference to provide the claimed element because the nozzle must be designed to mix the pressurized carrier gas and the rinsing solution and to provide the desired output. Restated, Tolles’ spray nozzles 44 are designed to alternate flow between cleaning fluid and then pressurized air. Combining the flows of the cleaning fluid and the pressurized air in the nozzle would not provide the desired spray output.

Accordingly, Applicant respectfully submits that Applicant’s invention as claimed in claims 14 and 19 is not rendered anticipated by the Tolles reference, and respectfully request the withdrawal of the rejection under 35 U.S.C. §102(e). Claims 15, 20 and 22 depend from claims 14 and 19 and are patentably distinct over the Tolles reference for at least the same reasons as stated above for claims 14 and 19. Applicant therefore contends that claims 14, 15, 19, 20 and 22 are patentably distinct over the Tolles reference and therefore respectfully requests the withdrawal of the rejection of claims 14, 15, 19, 20 and 22 under 35 U.S.C. §102(e).

Rejections under 35 U.S.C. §102(b)

Claims 1-11, 14-16 and 19-23 stand rejected under 35 U.S.C. 102(b) as being anticipated by US Pat App 2002/0023715 A1 by Kimura (hereafter the Kimura reference). Applicant respectfully traverses the rejection as will be described in more detail below.

The Kimura reference discloses a “cleaning mechanism for cleaning the polishing surface 10-1a of the polishing table 10-1. As shown, a plurality (four in the

illustrated embodiment) of mixing and injecting nozzles (*atomizers*) 10-11a to 10-11d for mixing pure water and nitrogen gas and for injecting the mixture are disposed above the polishing table 10-1. To each of the mixing and injecting nozzles 10-11a to 10-11d, nitrogen gas pressure of which is adjusted by a regulator 16 is supplied from a nitrogen gas supply source 14 through an air operator valve 18 and pure water pressure of which is adjusted by a regulator 17 is supplied from a pure water supply source 15 through an air operator valve 19” (Paragraph 53, emphasis added).

As to claims 1, 14 and 17, the Kimura reference does not disclose a method of delivering a liquid to a CMP polishing pad that includes supplying the liquid to a nozzle, the nozzle being oriented toward a polishing surface of the CMP polishing pad. The liquid flows at a rate of less than or equal to about 100 cc per minute. A pressurized carrier gas is also supplied to the nozzle simultaneously with the liquid. The liquid is substantially evenly sprayed from the nozzle onto the CMP polishing pad.

As to claims 19, the Kimura reference does not disclose a system for applying a liquid to a CMP polishing pad including a nozzle directed toward the CMP polishing pad. The nozzle having a first and a second input. The first input being coupled to a first supply and the second input being coupled to a carrier gas supply. The first supply and the carrier gas supply are supplied to the nozzle simultaneously. The first supply is supplied at a rate of less than or equal to about 100 cc per minute.

Accordingly, Applicant respectfully submits that Applicant’s invention as claimed in claims 1, 14, 17 and 19 is not rendered anticipated by the Kimura reference, and respectfully request the withdrawal of the rejection under 35 U.S.C. §102(b). Claims 2-11, 13-16, 18 and 20-23 depend from claims 1, 14, 17 and 19 and are patentably distinct over the Kimura reference for at least the same reasons as stated above for claims 1, 14, 17 and 19. Applicant therefore contends that claims 1-11, 14-16 and 19-23 are patentably distinct over the Kimura reference and therefore respectfully requests the withdrawal of the rejection of claims 1-11, 14-16 and 19-23 under 35 U.S.C. §102(b).

Rejections under 35 U.S.C. §103(a)

Claims 12, 13, 17 and 18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the Kimura reference as applied to claims 1-11, 14-16 and 19-23 above, in view of US Pat 6,338,669 by Togawa et al. (hereafter the Togawa reference). Applicant respectfully traverses the rejection as described in more detail below.

The Togawa reference discloses a polishing machine for polishing an article such as a semiconductor wafer. A movable arm is located at a liquid supply position for supplying a liquid such as a polishing liquid onto a polishing surface of a turntable. The arm is also adapted to be moved to and held at a retracted position radially outside the polishing surface. At the liquid supply position, liquid supply nozzles supported on the arm are brought into a condition such that the nozzles are close to a position on the polishing surface where the liquid is to be supplied, whereby the liquid is accurately supplied onto the position. Holding the arm at the retracted position makes it easy to conduct a maintenance work for the polishing surface and so on.

As to claims 1, 14 and 17 neither the Kimura reference nor the Togawa reference, whether considered alone or in combination, teach or suggest a method of delivering a liquid to a CMP polishing pad that includes supplying the liquid to a nozzle, the nozzle being oriented toward a polishing surface of the CMP polishing pad. The liquid flows at a rate of less than or equal to about 100 cc per minute. A pressurized carrier gas is also supplied to the nozzle simultaneously with the liquid. The liquid is substantially evenly sprayed from the nozzle onto the CMP polishing pad.

As to claim 19, neither the Kimura reference nor the Togawa reference, whether considered alone or in combination, teach or suggest a system for applying a liquid to a CMP polishing pad including a nozzle directed toward the CMP polishing pad. The nozzle having a first and a second input. The first input being coupled to a first supply and the second input being coupled to a carrier gas supply. The first supply and the carrier gas supply are supplied to the nozzle

simultaneously. The first supply is supplied at a rate of less than or equal to about 100 cc per minute.

It would not be obvious to modify the Kimura reference to provide the claimed elements because it is not obvious to nor simple modification achieve an even spray of a liquid having a flow rate of less than or equal to about 100 cc per minute. As described in the background section of the Applicant's application:

“Slurry and other process chemistries can also be very expensive. As a result, a higher process chemistry flow rates can equate to a higher CMP operating cost. In many CMP operations a slurry flow rate of less than about 100 cc/minute or less can provide equivalent results as a slurry flow rate of 200 cc/minute or more. However, the typical process chemistry dispensing systems cannot accurately and effectively dispense process chemistries at flow rates less than about 100 cc/minute. Excess process chemistries can also create an excessive waste byproduct stream. The excessive waste byproduct stream can further increase the operating cost due to the disposal and or recycling cost associated with the waste stream” (Paragraph 9).

Accordingly, Applicant respectfully submits that Applicant's invention as claimed in claims 1, 14, 17 and 19 is not rendered obvious by either of the Kimura reference nor the Togawa reference, whether considered alone or in combination, and respectfully request the withdrawal of the rejection under 35 U.S.C. §103(a). Claims 2-11, 13-16, 18 and 20-23 depend from claims 1, 14, 17 and 19 and are patentably distinct over the Kimura reference and the Togawa reference, whether considered alone or in combination, for at least the same reasons as stated above for claims 1, 14, 17 and 19. Applicant therefore contends that claims 1-11, 14-16 and 19-23 are patentably distinct over the Kimura reference and the Togawa reference, whether considered alone or in combination, and therefore respectfully requests the withdrawal of the rejection of claims 1-11, 14-16 and 19-23 under 35 U.S.C. §103(a).

SUMMARY

In view of the foregoing amendments and remarks, Applicant respectfully submits that the pending claims are in condition for allowance. Applicant respectfully requests reconsideration of the application and allowance of the pending claims.

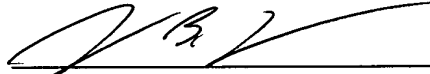
If the Examiner determines the prompt allowance of these claims could be facilitated by a telephone conference, the Examiner is invited to contact George B. Leavell at (408) 749-6900, ext 6923.

Deposit Account Authorization

Authorization is hereby given to charge our Deposit Account No. 50-0805 (Ref LAM2P441) for any charges that may be due or credit our account for any overpayment. Furthermore, if an extension is required, then Applicant hereby requests such extension.

Respectfully submitted,

MARTINE & PENILLA, LLP



George B. Leavell
Attorney for Applicant
Registration No. 45,436

Dated: October 27, 2004

710 Lakeway Drive, Suite 170
Sunnyvale, CA 94085
(408) 749-6900 ext 6923